Syndromic Surveillance Information Collection – Geocodes for Urban to Rural Mixed Environments: SSIC-Geo

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Objective: To understand GIS issues in a rural-to-urban setting and demonstrate limitations of ZIP-code-only approaches compared to census tract and block approaches.

Background: The University of Washington has been working since 2000 with partners in Washington State to advance bioterrorism (BT) detection and preparedness. This project collects data on patients presenting with influenza-like illnesses and other potentially BT-related syndromes at emergency departments and primary care clinics (Kitsap, Clallam, and Jefferson counties) using a secure automated informatics approach. Local health jurisdiction epidemiologists use a web-based interface to view de-identified data and use a version of CDC's EARS disease detection algorithms to watch for variances in patterns of diagnoses, volume, time and space as part of the public health real-time disease surveillance system. This processed hospital data is also made available back to the officials and administrators at the reporting hospital.

Methods: We have previously described our approach to de-identification using a cryptographic hash, SSIC-MD5. In this presentation we will describe the use of GIS data in the rural surveillance areas where ZIP codes are too large to meaningfully identify clusters.

The system uses geocoding software based on ESRI's ArcGIS running on servers behind the hospital's firewall so that patient addresses are not released externally. The transmitted data includes only the census tract and block group. Visualization of the census block may be restricted for some users or for particular areas. We will demonstrate the use of the web-based interface to the EARS analysis and demonstrate the use of geocoded data. We will discuss pros and cons of this approach.

Results: The GIS encoding module is new to the system and to date, the Syndromic Surveillance Information Collection (SSIC) Peninsula system has collected 58,542 hospital visits of interest (potentially of infectious nature), and a baseline of 123,285 (total visits) records total. Of these visits of interest, 28,624 (57%) were successfully geocoded. The relative scale of ZIP codes in rural areas demonstrates the need for finer-grained data such as block groups and tracts.

Conclusions: Our system uses PHIN-compatible messages for all surveillance data and has the ability to transmit reportable illnesses as well. We feel that the incorporation of GIS data, geocoded to the appropriate resolution for the region, as seen in our system, will add to the capabilities of syndromic surveillance. The SSIC-Geo is a methodology that allows for geographic data collection without disclosing or associating the patient's latitude and longitude or street address.

To improve the reliability of the geocoding module we are in the process of developing it as a stand-alone web service that will function without dependence on ArcGIS.

For more info, contact Bryant Karras at bkarras@u.washington.edu, phone 206-221-6676, or view our web site at http://cphi.washington.edu or the project page at http://ssic.nwcphp.org

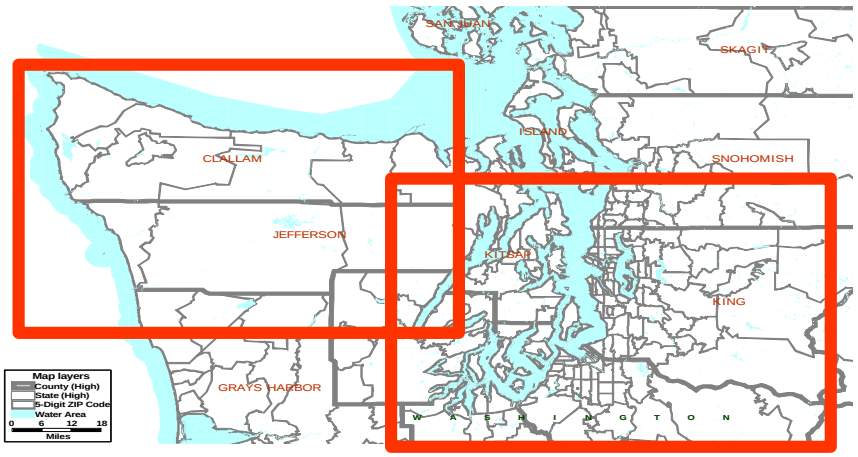

Figure 1: Note the relative granularity of ZIP codes in the respective urban and rural parts of Washington.